IOWA STATE UNIVERSITY
Digital Repository

Integrated Crop Management News | Agriculture and Natural Resources

8-1-2005

Root-lodged corn at or before silking

Roger W. Elmore
Iowa State University, relmore@iastate.edu

Follow this and additional works at: http://lib.dr.iastate.edu/cropnews

 Part of the Agricultural Science Commons, Agriculture Commons, and the Agronomy and Crop Sciences Commons

Recommended Citation
Elmore, Roger W., "Root-lodged corn at or before silking" (2005). *Integrated Crop Management News*. 1442.
http://lib.dr.iastate.edu/cropnews/1442

The Iowa State University Digital Repository provides access to Integrated Crop Management News for historical purposes only. Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user. Users should make their own assessment of the information and whether it is suitable for their intended purpose. For current information on integrated crop management from Iowa State University Extension and Outreach, please visit https://crops.extension.iastate.edu/.

Root-lodged corn at or before silking

Abstract
Several areas of Iowa last week experienced strong winds along with thunderstorms. Fortunately, these storms provided some much-needed moisture for kernel set on corn, but the winds in some places were strong enough to root lodge corn. Corn affected ranged from just silked (R1), the blister stage (R2), to some in the milk stage (R3). In areas with corn not yet tasseled, greensnap occurred. I'll discuss greensnap another time. For this article, I'll discuss the following: Why did some plants root lodge and others didn't? How will root lodging affect yield? And what can we learn that will reduce root lodging in the future?

Keywords
Agronomy

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences

This article is available at Iowa State University Digital Repository: http://lib.dr.iastate.edu/cropnews/1442

Root-lodged corn at or before silking

Several areas of Iowa last week experienced strong winds along with thunderstorms. Fortunately, these storms provided some much-needed moisture for kernel set on corn, but the winds in some places were strong enough to root lodge corn. Corn affected ranged from just silked (R1), the blister stage (R2), to some in the milk stage (R3). In areas with corn not yet tasseled, greensnap occurred. I'll discuss greensnap another time. For this article, I'll discuss the following:

Why did some plants root lodge and others didn't? How will root lodging affect yield? And what can we learn that will reduce root lodging in the future?

Why did some plants root lodge and others didn't?

- Hybrids vary in their tolerance of root lodging.
- Some of the root lodging occurred where rootworm larvae feeding was severe. Roots supporting the plants were ravaged to the point where they could not support the plant. In other areas, plants lodged simply due to strong winds and saturated soils.
- Some root lodging, nevertheless, occurred in areas without rootworm larval feeding. To understand this, let's think about the type of year and the moisture conditions the corn has experienced to date. This obviously varies in different parts of the state. Warm, dry conditions during corn's vegetative period results in deep root penetration while cool, wet conditions result in shallow root systems. The latter would result in corn that is more prone to root lodging.

Root mass reaches its maximum at silking (R1). Brace roots provide support to the stalk and are of considerable importance in "resurrecting" plants root lodged by strong winds. Fortunately, plants root lodged before R1--R2 are somewhat able to compensate for the canopy disruption caused by the lodging. After a couple of days, the upper portions of these plants resume a vertical growth pattern, "goosenecking." Although this rearrangement of the crop canopy may limit potential yield losses, it does make harvesting slower and increases the potential for ear loss during harvest.

How will root lodging affect yield?

An Iowa State study forced V10-stage corn to "lodge" at a 45° angle in plots with and without rootworms. Grain yield of lodged corn without rootworms yielded 11 and 40 percent less than the control in the two years of the study while lodged corn with rootworms yielded 12 and 28 percent of the control. Years made a big difference. It was concluded that lodging was more detrimental to biomass accumulation and yield than corn rootworm larval feeding itself. In a

separate study with natural root lodging, lodged plants intercepted 28 percent less light than unlodged plants.

This gives us some idea of the wide variation in years and among treatments at V10. Unfortunately, most of Iowa's corn was beyond V10 when root lodging occurred this year. Simulated root-lodging work from Wisconsin gets closer to answering the current question. Corn was lodged in two years at three growth stages each year (see table).

Lodging treatments first year	Grain yield (bu/acre)	Lodging treatments second year	Grain yield (bu/acre)
Control	199	Control	187
V10	191	V11--V12	181
V13--V14	182	V15	168
V17--R1	151	VT	160
LSD (0.05)	20	LSD (0.05)	10

Lodging did not affect plant development, but it did increase the number of barren plants. There were large differences in the two years with losses in the first year up to 30 percent and half of that in the second year. Overall, yields were reduced 2--6 percent when corn was lodged from V10--V12, 5--15 percent when corn was lodged from V13--V15, and 12--31 percent when corn was lodged on or after V17. I'd expect less yield reductions after R1 since VT--R1 are the most critical stages for leaf loss, plant loss, etc. to occur.

What can we learn that will reduce root lodging in the future?

- In areas where rootworm larvae feeding was the cause of the root lodging, use soil insecticides, crop rotations, or Bt hybrids resistant to rootworm feeding.
- Hybrid tolerances to root lodging are obvious this year and have been noted in research studies. Select hybrids that withstand root lodging.


[1]
Root-lodged corn at the Field Extension Education Laboratory (FEEL), July 28, 2005. (Roger W. Elmore)

This article originally appeared on pages 161-162 of the IC-494(21) -- August 1, 2005 issue.

Source URL:
http://www.ipm.iastate.edu/ipm/icm//ipm/icm/2005/8-1/rootlodge.html

Links:
[1] http://www.ipm.iastate.edu/ipm/icm/node/152

IOWA STATE UNIVERSITY
University Extension